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CHIGNIK MANAGEMENT AREA, 1992

SALMON REPORT
TO THE
ALASKA BOARD OF FISHERIES

By

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CHIGNIK AREA SALMON REPORT
TO THE BOARD OF FISHERIES
1992

INTRODUCTION

The Chignik Management Area (CMA) lies on the south side of the Alaska Peninsula between the Kodiak Management Area to the east and the Alaska Peninsula Management Area to the west. Kilokak Rocks is the eastern boundary and Kupreanof Point is the western boundary (Figure 1). The area is divided into five districts; the Eastern, Central, Chignik Bay, Western, and Perryville districts (Figure 2). There are approximately one hundred salmon streams within the area.

The Chignik lakes watershed is 274 km southwest of Kodiak. The major features of the watershed are two large, interconnected lakes; Black Lake and Chignik Lake, with a single outlet which empties into a nearly enclosed estuary, Chignik Lagoon (Figure 3).

Salmon management and research are conducted from the Alaska Department of Fish and Game field station located on the Chignik River. A 400 foot pile driven weir is constructed annually across the river for enumeration of sockeye salmon.

Sockeye salmon (*Oncorhynchus nerka* Walbaum) in the Chignik River system are the most important fishery resource in the area. There are two major sockeye salmon runs in the Chignik system. The runs spawn in different areas of the system and have a different time of spawning migration, length of freshwater residence as juveniles, and age at maturity (Higgins 1934; Narver 1963). The majority of returning adults of one run pass through the fishery in June and spawn in the tributaries to Black Lake (first run). Adults from the other run enter the fishery in late June and continue until late September with the period of peak abundance usually occurring during the third week of July. The adults from this run spawn in the tributaries to Chignik Lake, Chignik Lake beach areas, and Black River tributaries (second run).

Narver (1966) and Dahlberg (1968) estimated the desired escapement goals for the Chignik sockeye salmon runs at 400,000 fish for Black Lake and 250,000 fish for Chignik Lake, respectively (Table 1). Since 1966, the sockeye salmon runs to Chignik have been managed to ensure that these escapement goals are met. The effectiveness of this management strategy is evident from the increase in the Chignik runs during the last 30 years. The total run averaged 2.10 million between 1963-1972, 2.49 million between 1973-1982, and 2.86 million between 1983-1992.

Chignik Lakes system bound sockeye are not only caught within the Chignik Management Area, but also in the Cape Igvak and the Southeast District Mainland by allocation as defined in management plans where 80% of the harvested sockeye are considered to be of Chignik origin.

Cape Igvak is allocated 15% and Southeast District Mainland is allocated 7% of the total Chignik origin sockeye harvest through July 25 (Table 2).

Although the periods of peak passage of the Chignik sockeye salmon runs are usually between two and four weeks apart, enumerating the catch and escapement of each run is complicated due to a period of overlap from about mid-June to mid-July, when both runs pass through the fishery and enter the escapement. Inseason daily escapement by run are needed to manage the run for optimum escapements. Postseason estimates of the total catch and escapement of each run, and the age composition of each of these components, are needed to compile brood-year tables and to forecast the run by stock in subsequent years (Conrad 1985).

1992 SEASON SUMMARY

Sockeye Salmon

The Chignik weir was installed and operational on May 30. The installation was delayed due to a large accumulation of ice on Chignik Lake. The ice finally went out May 16 and the construction of the weir was started immediately. High water conditions from spring rains and melt off from an exceptionally large accumulation of snow resulted in the Chignik Lake water level rising and floating an unattended barge from its moorings. The barge floated downstream and into the weir, punching a 10 foot hole in the weir, early on the morning of June 4. The weir was once again fish tight by 1:15 p.m. on June 5. Only 163 sockeye salmon had been passed through the weir prior to the barge incident, therefore, it was estimated that an insignificant number of salmon escaped through the hole in the 31 hour period.

The 1992 Chignik sockeye salmon fishery started on June 17. The cumulative escapement of 114,000 sockeye salmon past the weir was within the desired range of 75,000 - 100,000 sockeye salmon by June 16. A test fishery on June 16 indicated an estimated 150,000 - 200,000 sockeye salmon in Chignik Lagoon. Inseason escapement goals (Table 1) are set for June and July in order to assure that the overall escapement goals of 400,000 sockeye salmon for the Black Lake run and 250,000 sockeye salmon for the Chignik Lake run are achieved.

The Chignik Bay, Central, and Eastern Districts were opened for 24 hours. The harvest for the 24 hour period was 133,261 sockeye salmon, which resulted in an average catch of 1,400 sockeye salmon per vessel. Good harvests and a steady increase in previous test fisheries on Ocean Beach merited an additional 24 hour extension until June 19. The total catch for that 48 hour opening was 203,000 sockeye salmon.

Escapement counts lagged after the first fishing period just meeting interim goals. Test fishing on June 22 revealed a moderate buildup of an estimated 50,000 sockeye salmon in Chignik Lagoon and coupled with a daily escapement rate of 28,000 sockeye salmon justified a 24 hour fishing period in the Central, Chignik Bay, and Eastern Districts. This fishing period was extended for Central and Chignik Bay Districts until July 11.

The Eastern District was closed to commercial salmon fishing July 2, to evaluate and determine the run strength in Chignik Lake (second run). The Chignik Bay District was closed July 11 to expand terminal waters to insure adequate escapements for first and second runs. The first run escapement was 370,000, and the second run escapement was 40,000 sockeye salmon.

The Eastern, Western, and Perryville Districts were opened on July 10 to help evaluate run strength of sockeye, pink, and chum salmon. The early opening also assured a quality harvest of pink and chum salmon. The Mitrofanina Section of the Western District was closed to avoid the harvesting of immature salmon as has been experienced in the past.

There is an overlap in the run timing of Black Lake (first run) and Chignik Lake (second run) sockeye salmon stocks. For management purposes, the time period from June 26 to July 9 is called the transition period with assessment of second run strength being the primary management objective. A major indicator of the transition from first run to second run stocks is the age class composition of the commercial harvest. Typically, the first run is dominated by age 1.3 and 1.2 fish, the second run is comprised of primarily age 2.3 and 2.2 fish. This year, the inseason model with a mean classification accuracy of 82%, showed that there was a growth rate differential between the two fry rearing environments (Black Lake and Chignik Lake). Through the model, the 50-50% transition overlap of the two runs was set at July 16. Chignik Lagoon scale samples taken from the commercial fishery totaled 10,000, while 1,800 scale samples were taken from the escapement in Black Lake. Chignik Lagoon samples collected through July 12 revealed that age 1.3 and 1.2 fish were most abundant, as expected, but later than usual. Both samples contained approximately 10% age 1.2 fish. Assessment of the second run was based on age samples and average weights in the commercial harvest. On July 5, as the percentage of age 2.3 fish and the average weights increased indicating a greater proportion of second run fish, the management priority shifted from first run to second run fish. The harvest for June 26 through July 7 was 473,264 sockeye salmon.

The second run was not as strong as projected prior to the season. Harvests from July 8 through September 30, the last day of commercial fishing, totaled 339,311 sockeye salmon. The preliminary inseason escapement estimate for the Chignik Lake stocks through August 5, the last day of counting at the weir, was 242,017 sockeye salmon, essentially meeting the 250,000 fish second run escapement goal.

Preliminary run estimates for the total Black Lake run catch and escapement was 1,024,279 and 488,737 while the total Chignik Lake catch and escapement was 587,247 and 278,017 (Figure

4). The total run of 2.4 million was within the 1992 forecasted range of 1.85 to 3.60 million and is 300,000 fish less than the point estimate of 2.70 million (Table 3).

Chinook Salmon

The 1992 chinook salmon harvest was a record (for years 1960-92) 10,832 fish (Figure 5 and Table 4). The catch was well above the 5,000 fish harvest prediction. The escapement totaled a minimum 3,806 fish (chinook greater than 650 mm in length) excluding in-river sport and subsistence harvests (Table 5). The majority of this harvest came from the Chignik Bay District where chinook are caught incidental to the sockeye salmon fishery. The Chignik River is the only major chinook producing stream within the Chignik Area.

Pink Salmon

The 1992 pink salmon harvest was 1.55 million fish, below the 2.00 million projected harvest, but above the 1983-1992 average harvest of 813,441 salmon (Figure 6 and Table 4). The projected harvest would have easily been exceeded, except that fishermen targeted sockeye salmon instead of pink salmon due to the lower pink salmon prices. The pink salmon returns were well above expectations for the remainder of the Alaskan Peninsula, while Kodiak management areas were well below expectations. Pink salmon escapements were very good in the Eastern District and average in the Western and Perryville Districts (Table 5).

Chum Salmon

The 1992 chum salmon harvest of 222,134 fish was only slightly below the forecasted 235,000 harvest (Table 3). The 1983-1992 average harvest of 157,480 was substantially below the 1992 chum salmon harvest (Figure 7). The majority were harvested in Central and Western Districts. Problems encountered with immature chum and sockeye salmon catches in the past years, prompted commercial fishing closures in the Mitrofanina Section of the Western District in early July.

Coho Salmon

The 1992 coho salmon harvest totaled 310,943 fish, the second largest on record, was over 100,000 fish more than the harvest projection of 200,000 coho salmon (Figure 8). Fishing effort for coho salmon continued through September. No estimates of escapement in the Chignik Lakes

system are available because the weir was removed prior to the start of the coho salmon run, and limited aerial surveys were conducted. Aerial surveys of Eastern District streams in early September revealed average coho salmon escapements. Overall, escapement monitoring of coho salmon in the Chignik Area is sporadic due to the timing of the run and logistics involved in monitoring the many streams within the area.

ECONOMIC VALUE OF THE 1992 SEASON

There were 103 registered vessels fishing the CMA in 1992. The ex-vessel value of all salmon species caught within this area was estimated at \$15.3 million based on the average price per pound paid to the fishermen for each species (Figure 9). The estimated income per vessel was \$151,000 (Figure 10). The total value of Chignik bound sockeye salmon to commercial fishermen from the Chignik¹, Kodiak², and Alaska Peninsula² Management areas was estimated at \$15.9 million.

¹ Estimated sockeye salmon catch for the Chignik Management Area is 1,277,000.

² Estimated Cape Igvak catch of Chignik bound sockeye salmon is 156,317 and 177,716 for Southeast District Mainland areas. The Cape Igvak and Southeast District Mainland figures represent 80% of the sockeye catches for those areas as it is estimated that roughly 80% of the sockeye caught in the Cape Igvak section and Southeast District Mainland are destined for Chignik. As outlined in the management plans for these two areas, those catches through 25 July are used to estimate the percent interception of Chignik bound salmon (Table 3).

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Table 1. Chignik inseason escapement schedules for Black Lake (early run) and Chignik Lake (late run).

| <u>EARLY RUN - 400,000 ESCAPEMENT</u> | | | |
|---------------------------------------|-------|--|---------|
| June 12 | | | 40,000 |
| June 14 | 50 - | | 65,000 |
| June 16 | 75 - | | 100,000 |
| June 18 | 125 - | | 150,000 |
| June 20 | 175 - | | 200,000 |
| June 22 | 225 - | | 250,000 |
| June 25 | 275 - | | 325,000 |
| June 30 | 350 - | | 400,000 |

| <u>LATE RUN - 250,000 ESCAPEMENT</u> | | | |
|--------------------------------------|---------------|---|---------|
| <u>EARLY ESCAPEMENT IS ACHIEVED</u> | | <u>EARLY ESCAPEMENT IS NOT ACHIEVED</u> | |
| July 6 | - | | 40,000 |
| July 8 | - | 45 - | 50,000 |
| July 10 | 40,000 | 55 - | 65,000 |
| July 12 | 50 - 60,000 | 70 - | 75,000 |
| July 14 | 65 - 75,000 | 75 - | 80,000 |
| July 16 | 80 - 90,000 | 80 - | 90,000 |
| July 19 | 100 - 115,000 | 100 - | 115,000 |
| July 21 | 125 - 135,000 | 125 - | 135,000 |
| July 23 | 145 - 160,000 | 150 - | 160,000 |
| July 26 | 170 - 180,000 | 170 - | 180,000 |
| July 29 | 185 - 195,000 | 190 - | 195,000 |
| July 31 | 195 - 200,000 | 195 - | 200,000 |

Table 2. Harvest of Chignik bound sockeye salmon in the Chignik, Cape Igvak, and Southeast District Mainland Areas^a from 1964-1992.

| Year | Chignik Area | | Cape Igvak | | Southeast District Mainland Area | | Total |
|-------------------|--------------|---------|------------|---------|----------------------------------|---------|-----------|
| | Catch | Percent | Catch | Percent | Catch | Percent | |
| 1964 ^b | 556,890 | 90.57 | 14,980 | 2.44 | 43,021 | 7.00 | 614,891 |
| 1965 | 599,553 | 89.94 | 11,021 | 1.65 | 56,020 | 8.40 | 666,594 |
| 1966 | 219,794 | 87.99 | 18,003 | 7.21 | 12,011 | 4.81 | 249,808 |
| 1967 | 462,000 | 91.48 | 23,014 | 4.56 | 20,021 | 3.96 | 505,035 |
| 1968 | 977,382 | 82.53 | 135,951 | 11.48 | 70,959 | 5.99 | 1,184,292 |
| 1969 | 394,135 | 78.96 | 97,982 | 19.63 | 7,013 | 1.41 | 499,130 |
| 1970 | 1,325,734 | 72.51 | 434,394 | 23.76 | 68,181 | 3.73 | 1,828,309 |
| 1971 | 1,016,136 | 76.95 | 253,044 | 19.17 | 51,272 | 3.88 | 1,320,452 |
| 1972 | 378,218 | 87.99 | 33,865 | 7.88 | 17,752 | 4.13 | 429,815 |

1964-72 catch and percentage figures are total for the entire season. Catch figures and percentages after 1972 are only through July 25.

| | | | | | | | |
|---------------------|-----------|-------|---------|-------|---------|-------|-----------|
| 1973 ^c | 769,256 | 89.01 | 57,348 | 6.64 | 37,613 | 4.35 | 864,217 |
| 1974 | 530,278 | 74.12 | 122,071 | 17.03 | 64,564 | 9.01 | 715,444 |
| 1975 | 115,984 | 81.78 | 23,635 | 16.67 | 2,205 | 1.55 | 141,824 |
| 1976 | 792,024 | 83.08 | 117,926 | 12.37 | 43,356 | 4.55 | 953,306 |
| 1977 | 1,547,285 | 90.61 | 128,852 | 7.55 | 31,498 | 1.84 | 1,707,635 |
| 1978 ^{d,e} | 1,454,389 | 85.38 | 227,014 | 13.33 | 21,952 | 1.29 | 1,703,335 |
| 1979 ^f | 794,504 | 80.30 | 139,550 | 14.10 | 55,352 | 5.59 | 989,406 |
| 1980 | 670,001 | 91.33 | 32 | 0.00 | 63,570 | 8.67 | 733,603 |
| 1981 | 1,606,300 | 79.88 | 282,727 | 14.06 | 121,870 | 6.06 | 2,010,897 |
| 1982 | 1,250,768 | 84.46 | 167,401 | 11.30 | 62,767 | 4.24 | 1,480,936 |
| 1983 | 1,450,832 | 72.68 | 318,048 | 15.93 | 227,392 | 11.39 | 1,996,272 |
| 1984 | 2,474,405 | 73.93 | 449,372 | 13.43 | 423,068 | 12.64 | 3,346,845 |
| 1985 ^g | 696,169 | 79.91 | 123,627 | 14.19 | 51,421 | 5.90 | 871,217 |
| 1986 | 1,456,729 | 82.64 | 188,017 | 10.67 | 118,006 | 6.69 | 1,762,752 |
| 1987 | 1,659,915 | 78.02 | 321,120 | 15.08 | 146,886 | 6.90 | 2,127,921 |
| 1988 | 678,912 | 95.70 | 11,218 | 1.58 | 19,320 | 2.72 | 709,450 |
| 1989 | 502,477 | 99.12 | 0 | 0.00 | 4,485 | 0.88 | 506,962 |
| 1990 | 1,196,599 | 83.51 | 107,706 | 7.52 | 128,599 | 8.97 | 1,432,904 |
| 1991 ^h | 1,966,986 | 80.48 | 324,329 | 13.27 | 152,714 | 6.25 | 2,444,029 |
| 1992 ⁱ | 1,066,732 | 81.25 | 152,358 | 11.60 | 93,845 | 7.15 | 1,312,935 |

^a The Cape Igvak and Southeast District Mainland figures represent 80% of the total sockeye catches for those areas as it is estimated that roughly 80% of the sockeye caught in the Cape Igvak section and Southeast District Mainland Area are destined for Chignik.

^b The data from 1964 - 1972 are based on total yearly catches. Prior to 1973, Cape Igvak and Southeast District Mainland fisheries were set by regulation to weekly fishing periods, usually 5 days per week. Time modifications were implemented when poor escapements occurred at Chignik.

-Continued-

Table 2. (page 2 of 2)

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- ^c During 1973 through 1977 all three fisheries were managed on a day by day basis.
- ^d From 1978 - 1991, the Cape Igvak Fishery Management Plan allocated 15 percent of the total sockeye catch destined for Chignik.
- ^e During 1978, seining prior to July 11 was disallowed in the Southeast District Mainland. The set gillnet fishery was allowed to fish 3 days per week through July 10 after which the fishery was managed on the basis of local stocks.
- ^f During 1979-1984 and prior to July 11, fishing was allowed 5 days per week in the Southeast District Mainland Area (including Beaver Bay) with an estimated ceiling of 60,000 sockeye destined for Chignik. If the Chignik Area sockeye catch was 1,000,000 or more before July 11, the 60,000 ceiling was to be dropped.
- ^g Beginning in 1985, Southeast District Mainland Area was placed on an allocation of 6.2 percent of the total estimated Chignik sockeye catch through July 25. After July 25, Southeast District Mainland Area is managed on a local stock basis. The allocation changed back to an even 6 percent beginning in 1988. Seining is still not allowed prior to July 11.
- ^h Includes overescapement of 278,305 sockeye counted past the weir during the Chignik Area seiners' boycott (Jun 23 - Jul 4).
- ⁱ Review of Orzinski Lake historical and current escapement records led the Board to redefine the Southeast District Mainland Management Plan. Beginning in 1992, the Southeast District Mainland fishery exclusive of the Orzinkie Bay was placed on an allocation of 7.0 percent of the total estimated chignik sockeye catch through July 25.
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Table 3. Chignik Management Area forecasts for sockeye, chinook, pink, coho, and Chum salmon, 1992.

| FORECAST OF THE 1992 SOCKEYE SALMON RUN | | |
|---|---------------------------|--|
| | <u>Point Estimate</u> | <u>80% Prediction Forecast Range</u> |
| <u>Early Run</u> (Black Lake) | | |
| Total Run: | 1,800,000 | 1,150,000-2,500,000 |
| Escapement: | 400,000 | |
| Catch: | 1,400,000 | |
| <u>Late Run</u> (Chignik Lake) | | |
| Total run | 900,000 | 700,000-1,100,000 |
| Escapement: | 250,000 | |
| Catch: | 650,000 | |
| <u>Total Chignik Run</u> | | |
| Total Run | 2,700,000 | 1,850,000-3,600,000 |
| Escapement: | 650,000 | |
| Catch: | 2,050,000 | |

Chignik Management Area
1992 Harvest Projections
Point Estimates
(in thousands)

| <u>Chinook</u> | <u>Sockeye</u> | <u>Coho</u> | <u>Pink</u> | <u>Chum</u> | <u>Total</u> |
|----------------|----------------|-------------|-------------|-------------|--------------|
| 5 | 2,050 | 200 | 2,000 | 235 | 4,490 |

Table 4. Chignik Management Area commercial salmon catches by district, statistical area, and species, 1992.

| District | Stat Area | Catch by Species in Number of Fish | | | | | Total |
|-------------|-----------|------------------------------------|-----------|---------|-----------|---------|-----------|
| | | Chinook | Sockeye | Coho | Pink | Chum | |
| Chignik Bay | 27110 | 3,184 | 793,134 | 80,946 | 178,167 | 12,744 | 1,068,175 |
| | Total | 3,184 | 793,134 | 80,946 | 178,167 | 12,744 | 1,068,175 |
| Central | 27220 | 46 | 3,212 | 6,827 | 33,322 | 4,173 | 47,580 |
| | 27230 | 754 | 167,695 | 8,937 | 106,925 | 15,555 | 299,866 |
| | 27240 | 88 | 1,573 | 6 | 445 | 680 | 2,792 |
| | 27250 | 500 | 101,444 | 1,746 | 18,024 | 15,007 | 136,721 |
| | 27262 | 619 | 58,691 | 2,096 | 46,972 | 10,121 | 118,499 |
| | Total | 2,007 | 332,615 | 19,612 | 205,688 | 45,536 | 605,458 |
| Eastern | 27260 | 147 | 11,428 | 1,741 | 19,743 | 6,213 | 39,272 |
| | 27270 | 0 | 67 | 3 | 4,540 | 967 | 5,577 |
| | 27272 | 2 | 9 | 390 | 3,243 | 1,419 | 5,063 |
| | 27280 | 16 | 326 | 137 | 18,179 | 18,421 | 37,079 |
| | 27290 | 7 | 115 | 1,710 | 134,416 | 31,328 | 167,576 |
| | 27292 | 7 | 224 | 201 | 2,279 | 2,648 | 5,359 |
| | 27296 | 2 | 158 | 78 | 719 | 213 | 1,170 |
| | Total | 181 | 12,327 | 4,260 | 183,119 | 61,209 | 261,096 |
| Western | 27374 | 3,197 | 13,344 | 90,701 | 455,354 | 38,306 | 600,902 |
| | 27380 | 44 | 224 | 926 | 6,535 | 334 | 8,063 |
| | 27390 | 854 | 14,666 | 44,138 | 138,694 | 23,844 | 222,196 |
| | 27394 | 205 | 1,770 | 4,795 | 28,317 | 2,982 | 38,069 |
| | Total | 4,300 | 30,004 | 140,560 | 628,900 | 65,466 | 869,230 |
| Perryville | 27540 | 871 | 101,130 | 61,371 | 313,900 | 32,637 | 509,909 |
| | 27550 | 289 | 8,209 | 4,181 | 44,273 | 4,539 | 61,491 |
| | 27560 | 0 | 30 | 13 | 26 | 3 | 72 |
| | Total | 1,160 | 109,369 | 65,565 | 358,199 | 37,179 | 571,472 |
| Grand Total | | 10,832 | 1,277,449 | 310,943 | 1,554,073 | 222,134 | 3,375,431 |

Table 5. Chignik Management Area salmon escapements by district and statistical area, 1992.

| District | Stat-Area | Chinook | Sockeye | Coho ^a | Pink ^b | Chum ^c | Total |
|--------------------|-----------|---------|---------|-------------------|-------------------|-------------------|-----------|
| Chignik Bay | 271-10 | 3,806 | 766,754 | 27,750 | 55,750 | 100 | 854,160 |
| | Total | 3,806 | 766,754 | 27,750 | 55,750 | 100 | 854,160 |
| Central | 272-20 | 0 | 0 | 0 | 89,243 | 0 | 89,243 |
| | 272-30 | 0 | 0 | 0 | 7,200 | 7,528 | 14,728 |
| | 272-50 | 0 | 0 | 2,300 | 127,340 | 165,580 | 295,220 |
| | Total | 0 | 0 | 2,300 | 223,783 | 173,108 | 399,191 |
| Eastern | 272-60 | 0 | 0 | 0 | 265,119 | 81,601 | 346,720 |
| | 272-70 | 0 | 1,500 | 3,300 | 85,214 | 99,971 | 189,985 |
| | 272-72 | 0 | 0 | 0 | 15,915 | 28,080 | 43,995 |
| | 272-80 | 0 | 0 | 5,000 | 53,189 | 51,571 | 109,760 |
| | 272-90 | 0 | 0 | 800 | 485,185 | 33,238 | 519,223 |
| | 272-92 | 0 | 0 | 0 | 48,833 | 6,700 | 55,533 |
| | 272-96 | 0 | 0 | 0 | 364,646 | 5,700 | 370,346 |
| | Total | 0 | 1,500 | 9,100 | 1,318,101 | 306,861 | 1,635,562 |
| Western | 273-70 | 0 | 0 | 0 | 0 | 300 | 300 |
| | 273-72 | 0 | 0 | 0 | 31,855 | 45,614 | 77,469 |
| | 273-80 | 0 | 0 | 0 | 1,100 | 0 | 1,100 |
| | 273-82 | 0 | 0 | 0 | 1,312 | 180 | 1,492 |
| | 273-84 | 0 | 0 | 0 | 4,535 | 7,235 | 11,770 |
| | Total | 0 | 0 | 0 | 38,802 | 53,329 | 92,131 |
| Perryville | 275-40 | 0 | 0 | 0 | 150,363 | 29,556 | 179,919 |
| | 275-50 | 0 | 0 | 0 | 39,511 | 10,538 | 50,049 |
| | 275-60 | 0 | 0 | 0 | 500 | 200 | 700 |
| | Total | 0 | 0 | 0 | 190,374 | 40,294 | 230,668 |
| All District Total | | 3,806 | 768,254 | 39,150 | 1,826,810 | 573,692 | 3,211,712 |

^a Coho salmon escapement estimates for Chignik Lagoon were from methods from Reggarone (1989). Coho salmon were not aerial surveyed due to budget constraints.

^b Escapement estimates for pink and chum salmon were based on methods of Johnson and Barrett (1988).

^c The late run of chum salmon in the Ivanof River was not aerial surveyed due to budget constraints.

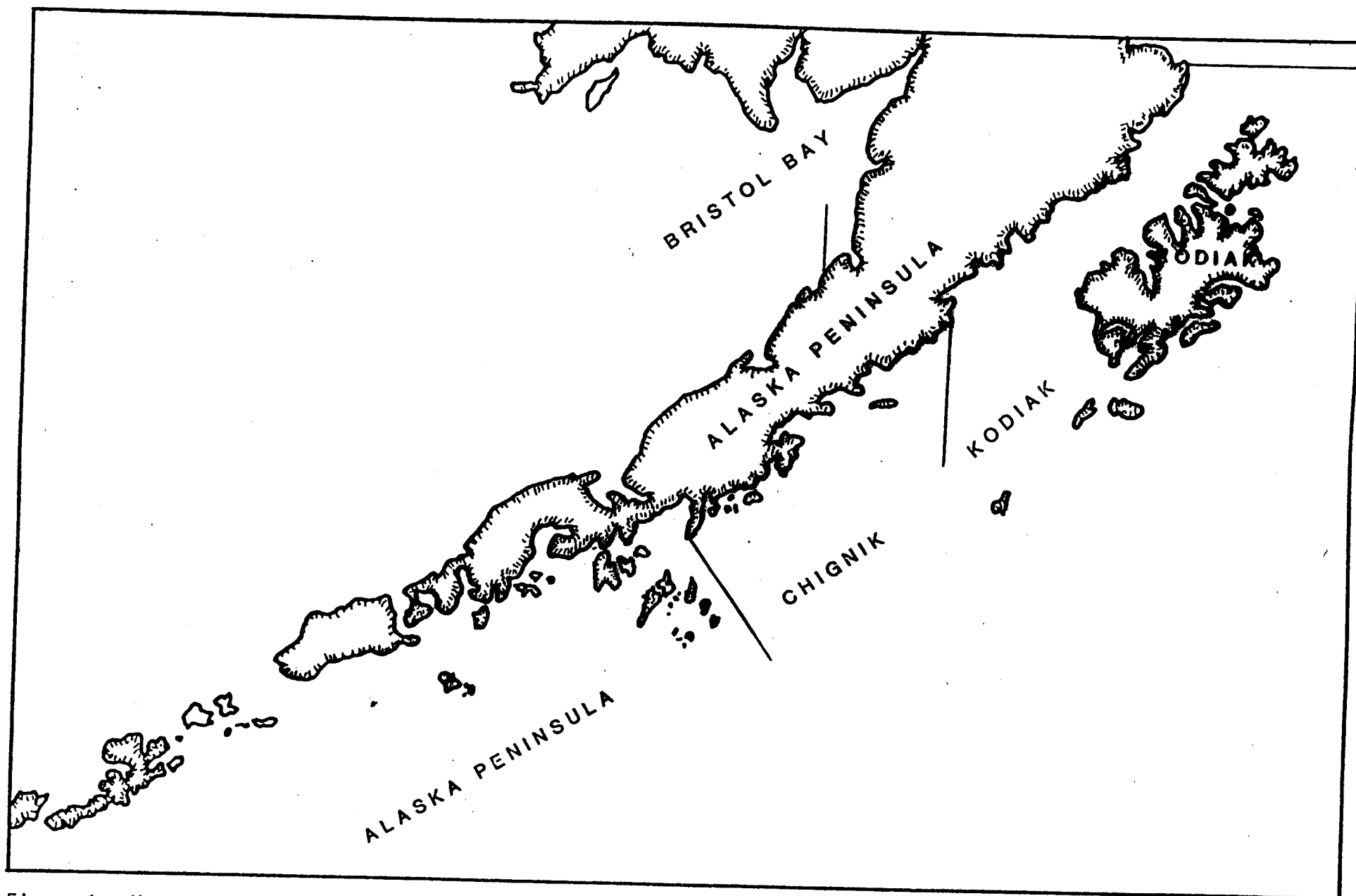


Figure 1. Map of the Alaska Peninsula illustrating the relative location of the Chignik Management Area.

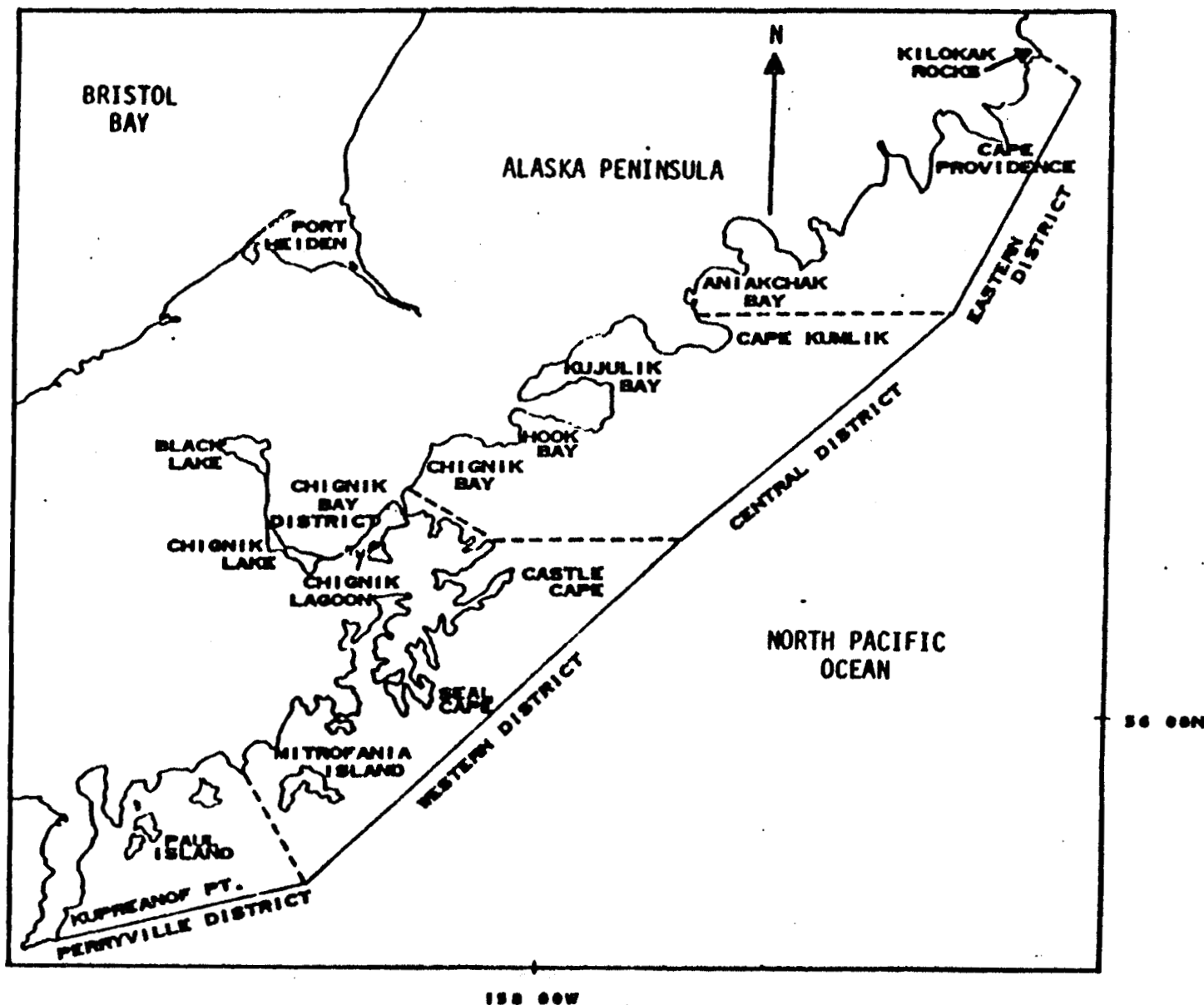


Figure 2. Map of the Chignik Management Area with the statistical fishing districts and some prominent locations identified.

CHIGNIK LAKES WATERSHED

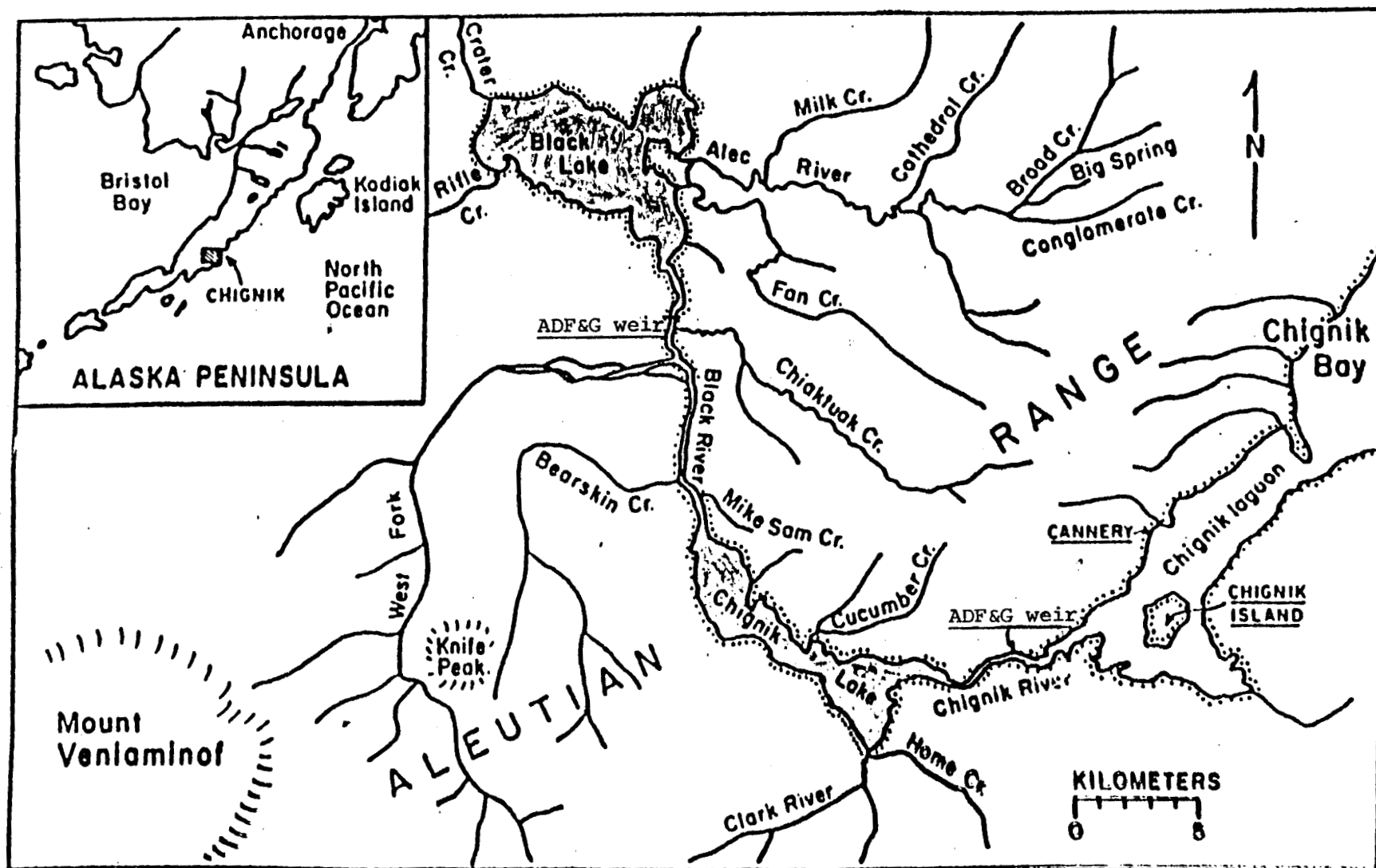


Figure 3. Map of the Chignik Management Area illustrating major sockeye spawning areas, 1992.

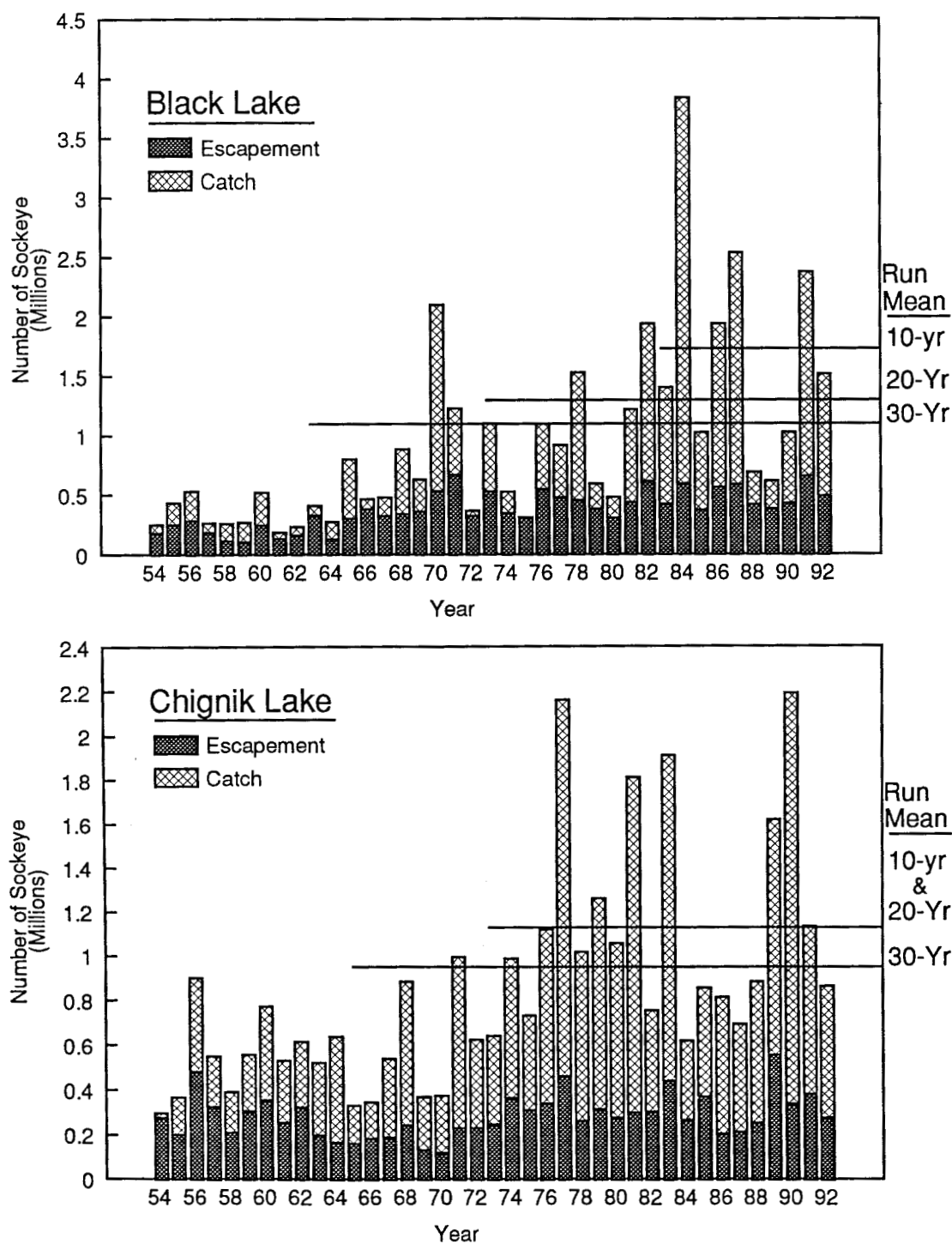


Figure 4. Black and Chignik Lake sockeye salmon catch and escapement, 1954-92.

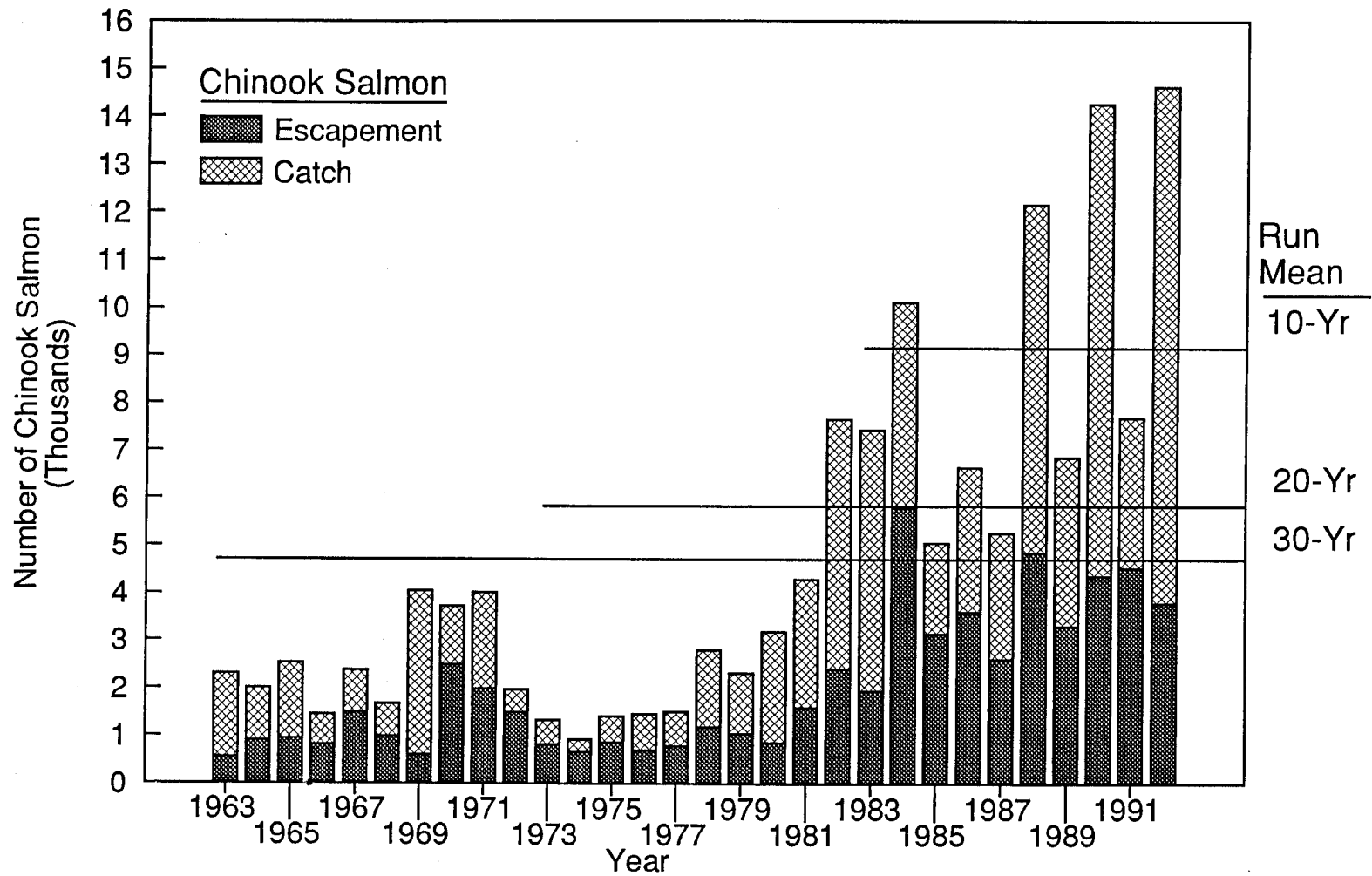


Figure 5. Chignik Management Area chinook salmon catch and escapement, 1963-92.

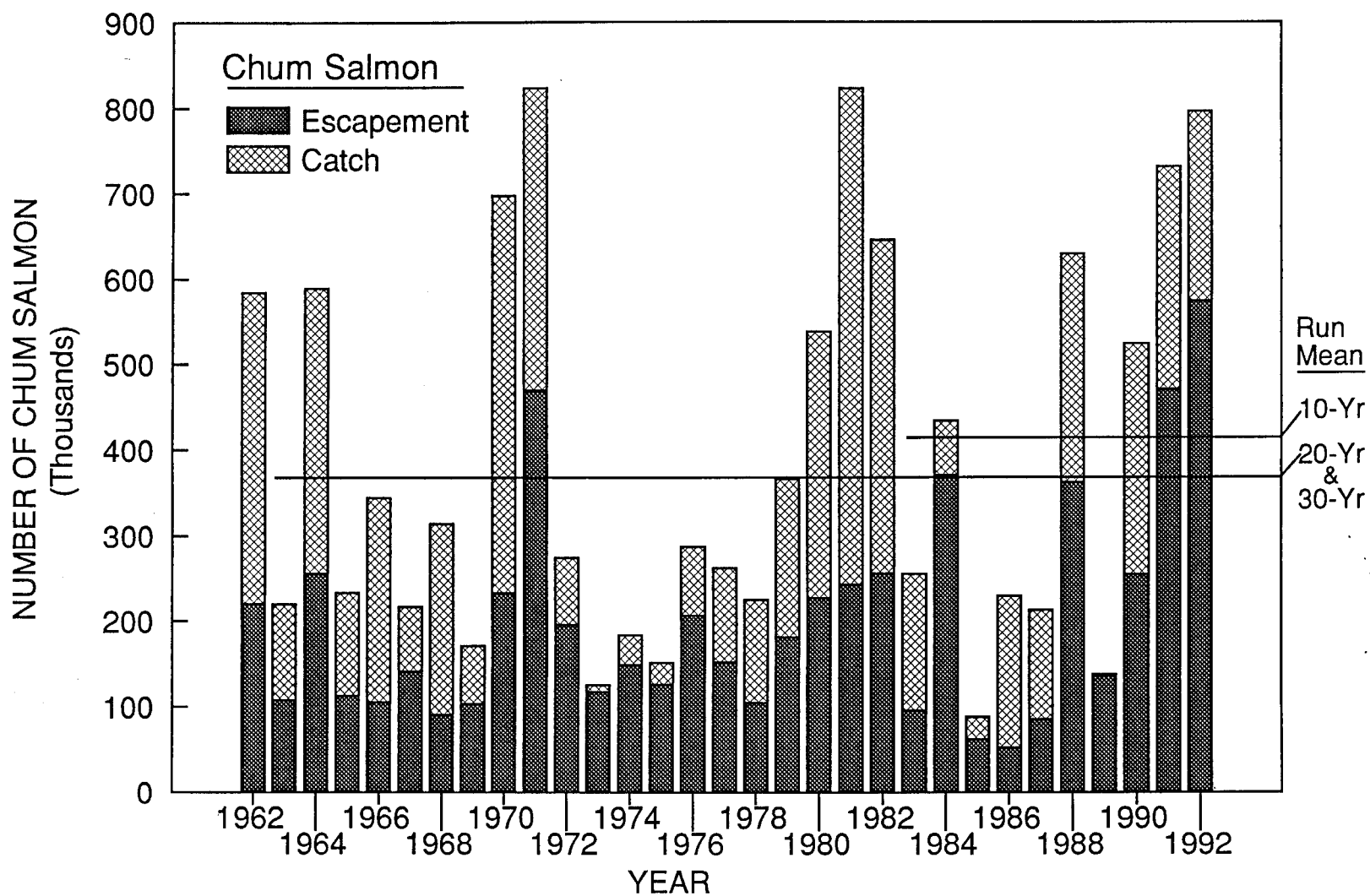


Figure 6. Chignik Mangagement Area chum salmon catch and escapement, 1962-92.

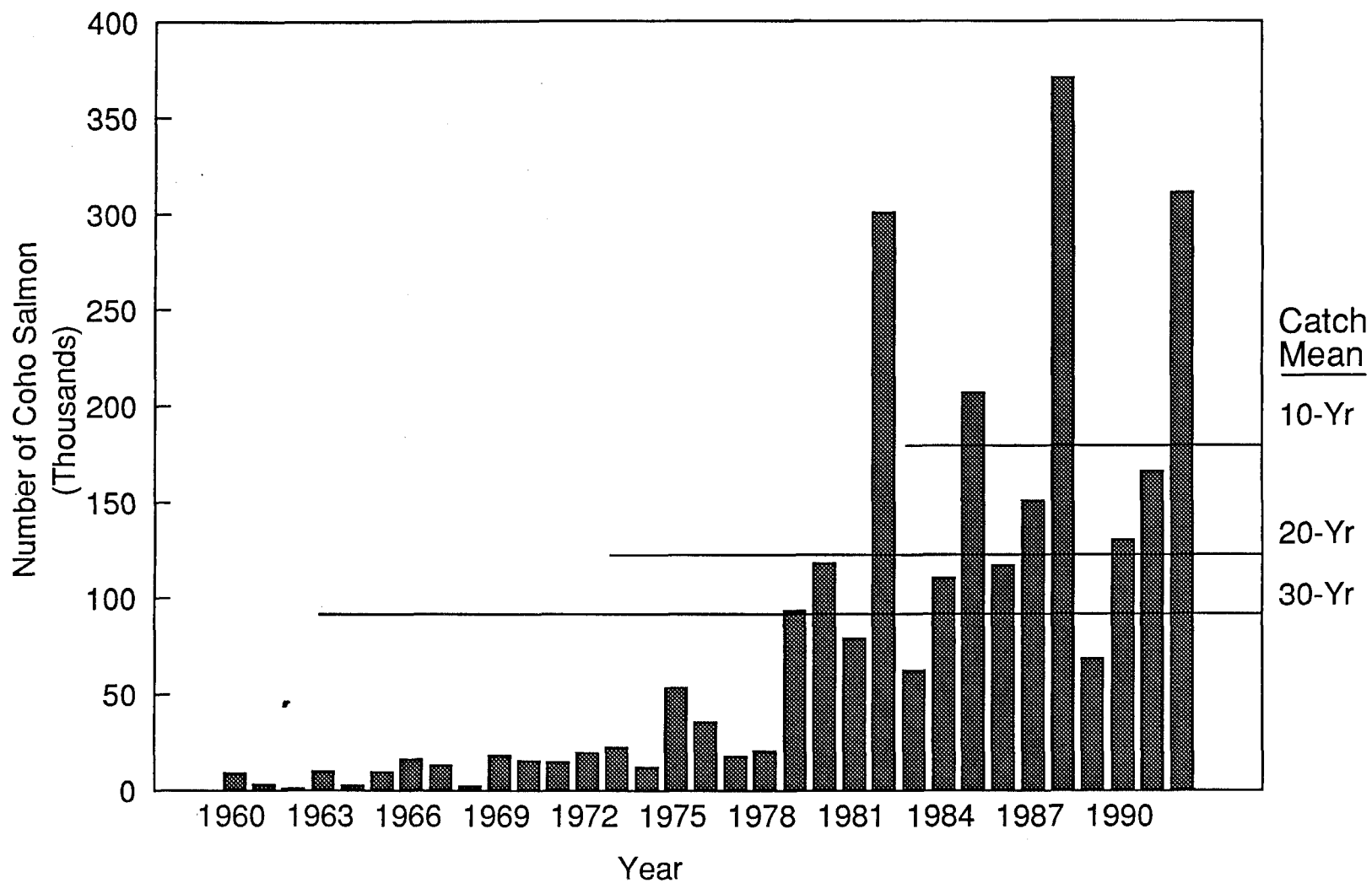


Figure 7. Chignik Management Area Coho salmon catch, 1960-92.

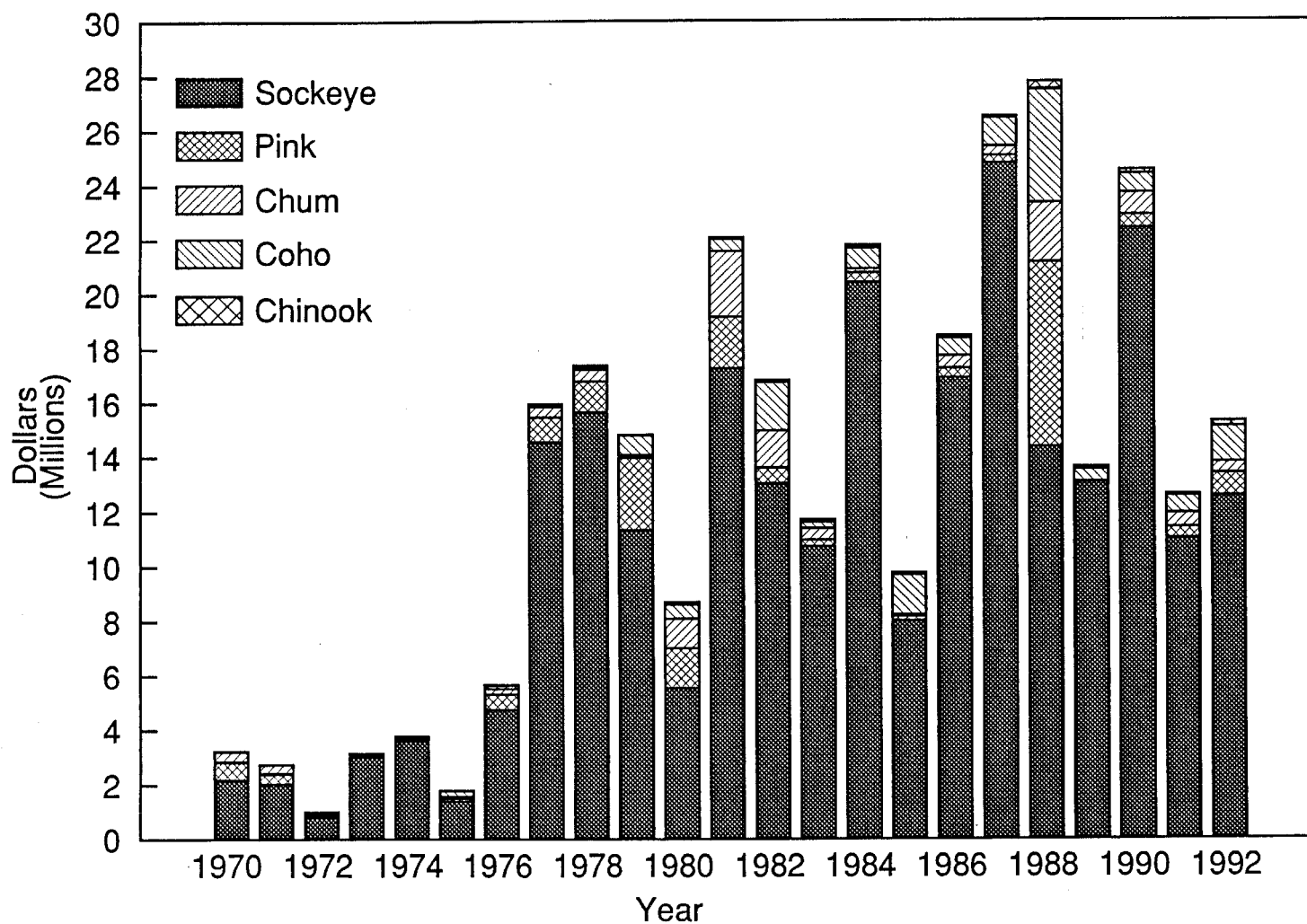


Figure 8. Exvessel value of Chignik Management Area salmon harvests, 1970-92.

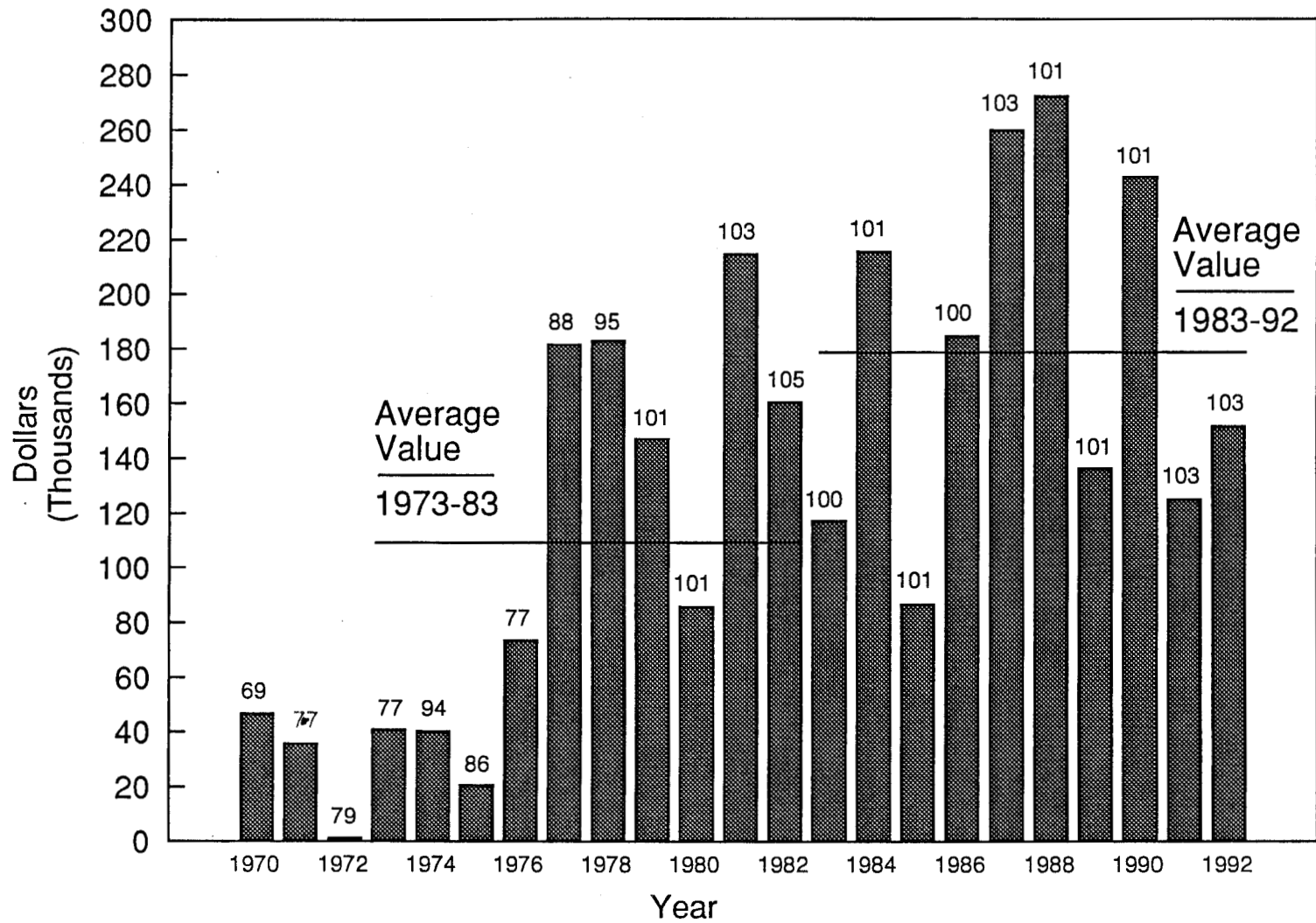


Figure 9. Average economic value of Chignik salmon per permit holder. Number above bar represents the number of permits fished that year.

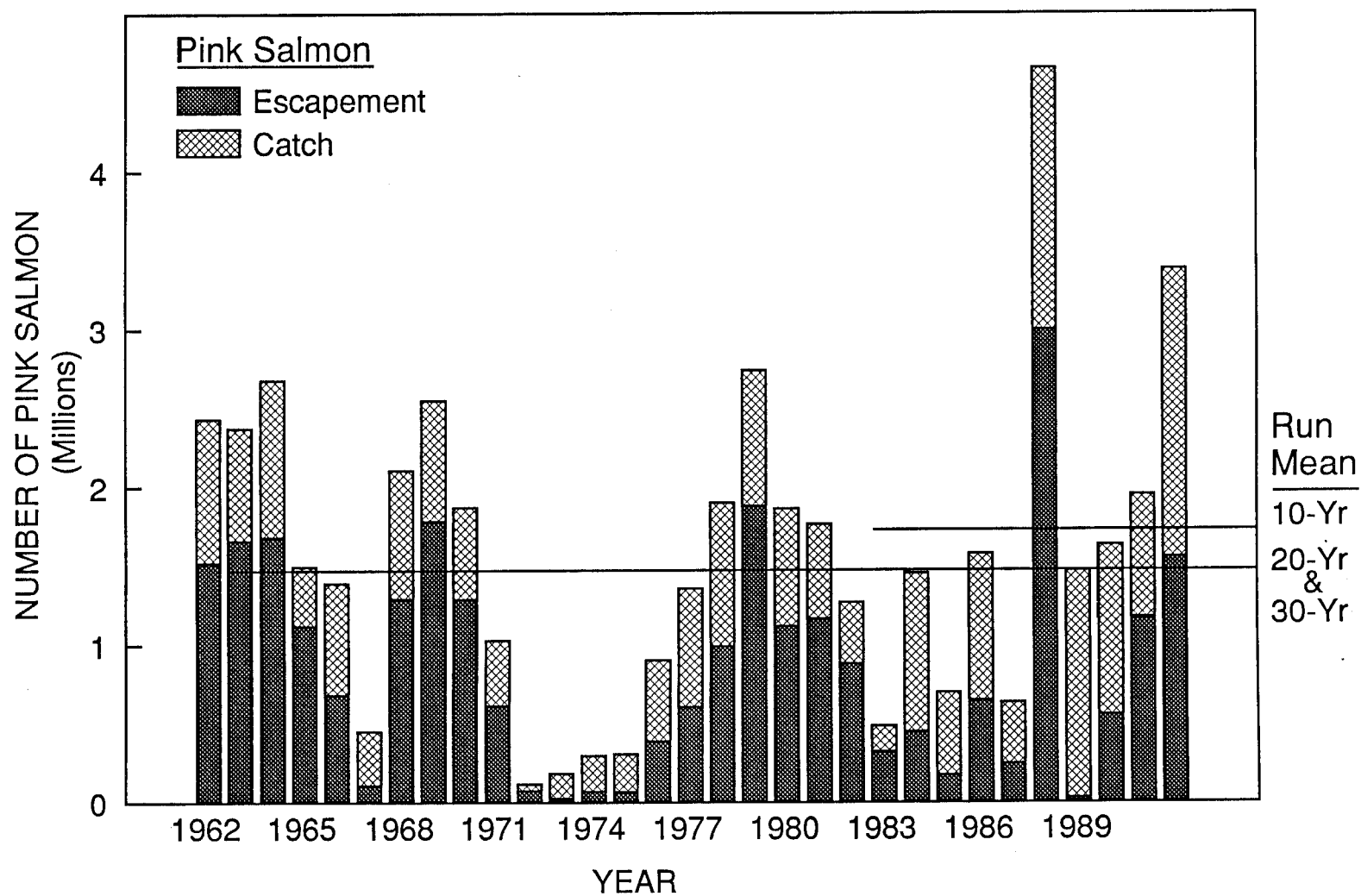


Figure 10. Chignik Management Area pink salmon catch and escapement, 1962-92.

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